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A Network-Centric Approach to Maritime Domain Awareness

ABSTRACT

The Integrated Deepwater System's C4ISR (command, control, communications, computers, intelligence, reconnaissance, and surveillance) system is a critical element in the U.S. Coast Guard's efforts to modernize its aging force structure and implement its maritime strategy for homeland security.

Conceived during the 1990s, the fully implemented Deepwater program will consist of three classes of new cutters and their associated small boats, a new and upgraded fixed-wing manned aircraft fleet, a combination of new and upgraded helicopters, both cutter-based and land-based unmanned aerial vehicles (UAVs), and highly improved systems for C4ISR and advanced logistics capabilities. Integrated Coast Guard Systems (ICGS, a joint venture between Lockheed Martin and Northrop Grumman) is Deepwater's partner in industry and systems integrator.

Deepwater's C4ISR capability improvements will contribute to higher levels of maritime domain awareness (comprehensive information, intelligence, and knowledge of all relevant entities within the U.S. maritime domain, and their respective activities, that could affect U.S. security, safety, economy, or environment). The Integrated Deepwater System (IDS) will play an important role in transforming the Coast Guard to meet the nation's 21st-century maritime-security requirements.

INTRODUCTION

The Deepwater acquisition strategy takes an integrated "system-of-systems" approach to upgrading existing Coast Guard surface and aviation legacy assets while developing new and more capable platforms and systems.

The Coast Guard's reliance on a capabilities-based system design led to the identification of broad C4ISR requirements in the Deepwater System Performance Specification. C4ISR capability requirements in the IDS contract award encompassed the areas of surveillance, detection, monitoring, internal and external information exchange, and situational awareness.

Deepwater's network-centric and interoperable C4ISR architecture will provide the means for Coast Guard operational commanders to develop better situational awareness, maintain a common operating picture, and manage risk wisely. This will, in turn, lead to more effective risk management and more productive force employment in all Coast Guard mission areas.

The Deepwater C4ISR architecture will contribute to improved maritime domain awareness through its provisions for disseminating shared tracks and real-time data streams, on-line intelligence, robust and seamless connectivity with continuous coordination, stand-alone capabilities, a combination of active and passive sensors, expanded surveillance and detection areas, and improved communications with all federal agencies and merchant shipping. Deepwater's C4ISR system will be compatible and fully interoperable with the agencies assigned to the Department of Homeland Security (DHS), as well as with the U.S. Navy, the Department of Defense, and other federal, state, and local agencies.

The Imperative for Recapitalization

Since the terrorist attacks of 9/11, the Coast Guard's leading role for safeguarding U.S. maritime homeland security has led to a greatly increased tempo of operations in ports, waterways, coastal areas, and the open ocean. Operational tempos also remain high in the Coast Guard's other traditional missions—maritime safety, maritime mobility, protection of natural resources, and national defense.

Looking to the future, joint Navy-Coast Guard intelligence assessments point to an increasingly complex and challenging maritime-security environment. Threats to U.S. national and economic security—in the form of international terrorism, drug smuggling, illegal migration, violations of environmental law, and illegal activity in the U.S. exclusive economic zone—are projected to increase. Such threats pose important implications for the maritime, military, and multimission U.S. Coast Guard.

The imperative for more modern and capable assets has fueled a growing recognition of the importance of the Integrated Deepwater System's progressive modernization and recapitalization program to future Coast Guard operational excellence. As Commandant Adm. Thomas H. Collins said, "Our Deepwater recapitalization program was important before 9/11. In light of today's increased maritime threats to the nation's security, it is not just important—it is urgent."[1]

The Integrated Deepwater System, planned now as a 20- to 30-year $17 billion (fiscal year 1998 dollars) effort, is the largest recapitalization program in the Coast Guard's 213-year history. Deepwater's assets—upgraded patrol boats, helicopters, aircraft, cutters, C4ISR sensors and systems, and integrated logistics—will operate across the entire U.S. maritime domain. A new Deepwater National Security Cutter (now scheduled for initial delivery in 2006) or

Offshore Patrol Cutter could be deployed hundreds of miles at sea to intercept and board a high-interest merchant ship or be assigned to serve as a key command-and-control platform in a major U.S. port in the event of a homeland security incident.

Compared to international naval forces, the average age of its cutters finds the Coast Guard ranked as one of the oldest fleets in the world. Most cutters now in service are based on designs dating to the 1960s. Some, like the 60-year-old workhorse USCGC *Storis* (still on station in Kodiak, Alaska), saw action during World War II. All categories of cutters and aircraft will reach block obsolescence by the end of this decade. This aging inventory of patrol boats, aircraft, helicopters, cutters, and C4ISR systems has generated growing concerns over the Coast Guard's ability to perform all of its assigned missions as the result of gaps in required capabilities and performance.

Today's technology gaps reflect the difficulties in upgrading equipment and platforms that are, in some cases, more than 30 years old. The lack of effective radar systems hinders sensing, detection, and tracking of maritime vessels. Similarly, a paucity of electro-optical sensors (e.g., infrared systems) to provide long-range night vision hinders all mobile assets operating at night and in inclement weather.

A logistics gap develops as older legacy platforms reach the end of their designated service life; the resultant increasing maintenance and repair costs often come at the expense of operational availability.

The operational requirement for a seamless C4ISR system appropriate to the Coast Guard's 21st century network-centric operations has been recognized for many years. The Coast Guard's past mix of largely obsolete C4ISR systems created a worrisome communications and "situational-awareness" gap—an intolerable condition during homeland security, national

defense, search-and-rescue, or law-enforcement missions.

The Coast Guard's present inventory of patrol boats, cutters, aircraft, helicopters, and shoreside operation centers does not share a common C4ISR architecture for surveillance, sensors, and communications equipment—making it difficult to communicate critical, secure, time-sensitive data and information to all Coast Guard units and shore facilities, or to a growing list of interagency operators. Breakdowns in connectivity can interfere with, delay, and even prevent mission execution.

The Coast Guard's past "platform-centric" approach for major acquisition programs generally resulted in a one-for-one replacement of cutters and aircraft over many years. This asset-specific focus generated inherent C4ISR limitations in the Coast Guard's fleet-wide ability to execute its principal sequence of core tasks: surveil, detect, classify, identify, and prosecute.

Modernization of Coast Guard C4ISR systems is a critical element in the Deepwater acquisition strategy. Past system-centric C4ISR technology "refresh" efforts were limited in scope and funding, falling short of realizing the enterprise architecture that the Coast Guard so clearly needs. This lack of a common C4ISR architecture created a situation where narrowly focused programmatic technology solutions did not integrate well and sub-optimized the broad application of information systems.

Deepwater's robust C4ISR systems will rectify these shortcomings and add important new capabilities critical to the successful execution of "port-centric" maritime homeland security operations.

Near-Term Improvements

The Coast Guard is correcting gaps in its command-and-control systems in the near term. The Coast Guard Command and Control Engineering Center (C2CEN), for

example, has developed a number of interim systems to upgrade legacy assets by providing proven, functional command-and-control (C2) systems—all in close coordination with the IDS program.

The Coast Guard's ongoing Command Center Recapitalization Project recognizes that operational commanders must have a robust C2 system to provide access to a common operating picture (COP), near-real-time data, a secure communications channel, and the means to communicate with the Coast Guard's counterparts in the Department of Defense (DOD).

DOD's Global Command and Control System (GCCS) will serve as the Coast Guard's near-term means to integrate information and data from disparate sources. The GCCS-J system will satisfy homeland security mission requirements at all Coast Guard area, district, and section command centers. GCCS applications also will improve C2 capabilities at lower-tier commands.

As part of its continuing efforts to take the "search" out of search-and-rescue missions, the Coast Guard awarded in September 2002 the award of a $611 million contract to General Dynamics Corp. for the production, deployment, and support of "Rescue 21," a modernization of the National Distress and Response System. Rescue 21 will be the nation's primary maritime system for coastal waters of the continental United States, Alaska, Hawaii, Guam, Puerto Rico, and U.S. navigable rivers and lakes.

The Rescue 21 system was coordinated fully with the Coast Guard's Integrated Deepwater System acquisition team for more than three years, and the requirement for full interoperability is incorporated into the IDS C4ISR architecture.

Under the current plan, IDS will begin deploying the Coast Guard Common Command and Control (CG-C2) in 2005. CG-C2 provides an IDS C2 enterprise

deployed to all IDS assets supporting all command echelons—execution, tactical, operational, and strategic. The same CG-C2 application supports cutter OPCEN watchstanders, mission controllers in a maritime patrol aircraft (MPA), and command duty officers at a Coast Guard district command center.

The CG-C2 system has at its foundation the Defense Information Infrastructure Common Operating Environment (DII COE). Application segments will provide specific IDS functionality. Application segments include mission planning and decision tools, and automation aides. DII COE ensures joint interoperability and enables the IDS program and Coast Guard to maximize the use of commercial-off-the-shelf technology (COTS) and commercial nondevelopment items (CANDI).

As a connected node in Deepwater's Information Technology-21 (IT-21) enterprise, watchstanders will be provided full access to SIPRNET (Secure Internet Protocol Router Network), CGDN+ (Coast Guard Data Network Plus), and the Internet. Communications integration with CG2-C2 will allow a watchstander to be connected in real time to both onboard fleet and shore-based information stores and databases.

Work has begun in earnest on an enterprise C4ISR architecture that takes into account the needs of both legacy and new assets—in the air and on the ground, and across agency boundaries—to achieve better information sharing, display, and storage.

A C4ISR System of Systems

The Integrated Deepwater System is building and expanding on recent Coast Guard command-and-control efforts to provide a far more effective "system-of-systems" solution for 21st-century C4ISR requirements. For the first time, the Coast Guard is looking beyond individual assets and classes of assets to address the overall

C4ISR requirements of all of its operational forces and shore stations. The Deepwater C4ISR team has adopted an information technology strategy of planned evolution.

Prior to Deepwater's contract award in June 2002 to Integrated Coast Guard Systems, industry was provided broad C4ISR capabilities-based requirements (Table 1).

TABLE 1. C4ISR Capability Requirements

Integrated Deepwater System

Deepwater's reliance on capabilities-based system design is reflected in the broad C4ISR requirements established for the IDS contract award:

- **Surveillance, detection, and monitoring:** Be capable of determining what and whom resides, enters, and exits … the Deepwater area of operational responsibility;
- **Internal Information Exchange:** Maintain simultaneous real-time voice, video, and data communications between all Coast Guard assets;
- **External Information Exchange:** Maintain simultaneous real-time voice, video, and data communications with the Department of Defense, other federal agencies, state and local government, NATO and similar coalitions;
- **Situational Awareness:** Maintain awareness of the operating environment, to include fusion of local tactical information with database information in near real time.

These requirements covered the areas of surveillance, detection, and monitoring; internal and external information exchange; and maintaining situational awareness. During the next five years, all Coast Guard shore commands and legacy surface and air platforms will be outfitted with Deepwater C4ISR system upgrades. Concurrently, IDS will continue the Coast Guard's low-risk transition to more capable platforms equipped with new and improved C4ISR systems designed to conform to Deepwater's network-centric architecture.

The IDS C4ISR system-of-systems solution design provides a single, integrated enterprise across the IDS that will be implemented through the deployment of individual assets. Progressively (through four increments to achieve a planned evolution of C2 capabilities) and cumulatively, the IDS C4ISR system will deliver numerous improvements across all Coast Guard mission sets (Table 2).

Table 2. Deepwater C4ISR Capabilities

IDS C4ISR Capabilities

- **Open and common architecture**: Shore to sea to air and interoperable with DHS, DOD, Coast Guard, and other agencies and forces;
- **Improved Connectivity and Bandwidth:** Double INMARSAT bandwidth to 128Kbps (when service is available) and SIPRNET to deployed assets.
- **Sensor Network:** ESM, DF, radar, EO/IR systems on mobile assets;
- **Common Command & Control:** Using CG-C2 based on DII COE and adapted to Coast Guard missions. Provides for common operating picture for all Deepwater shore, ships, and air assets;
- **Intelligence:** Supports and increases capabilities with baseline study, intelligence concept of operations, improved specific emitter identification capabilities, and other upgrades.

Of note, a single C2 (command and control) system will support a Command and Control Enterprise. Common C2 systems will be fully integrated with all sensors, communications, and legacy interfaces. Tactical data from all assets and intelligence will be integrated into a common operating picture. The Deepwater C4ISR system will be interoperable within IDS, and with other Coast Guard assets, DHS, DOD and national sources, commercial and private vessels, and law-enforcement agencies.

Maritime domain awareness and the ability to target actual threats will be achieved through the generation of actionable, timely, and integrated intelligence information. An imbedded technical "refresh" capability will help to avoid future system obsolescence. In keeping with Deepwater's overarching goals to maximize operational effectiveness at the lowest total ownership costs, the IDS C4ISR architecture and software will reduce operational costs, improve mission effectiveness, and accommodate future technological improvements.

Strategic Partnerships

Forging strategic partnerships at home and abroad guides the Coast Guard's approach to the future. In 2002, for example, the Coast Guard became a formal member of the National Foreign Intelligence Program. The Coast Guard also has expanded cooperative efforts with the U.S. Navy at the National Maritime Intelligence Center. New Maritime Intelligence Fusion Centers are providing better tactical intelligence to field commanders. The Coast Guard's ability to share information that is gathered by all agencies to derive tactical applications at the operational level is steadily improving.

This strategic collaboration encompasses Deepwater's C4ISR program as an extension of the agreement reached between the Chief of Naval Operations and the Commandant of the Coast Guard to build a National Fleet that will combine Navy and Coast Guard forces to maximize their effectiveness across all naval and maritime missions.

A key aspect of the IDS team's approach to the design and development of future Coast Guard assets and systems is to harmonize its efforts with the Navy through a close linkage to one of its current acquisition efforts—the Littoral Combat Ship (LCS). In April 2002, Deepwater Program Executive Officer Rear Adm. Patrick M. Stillman and Rear Adm. Charles S. Hamilton, now the Navy's Program

Executive Officer—Ships, signed a memorandum of understanding to establish a working group to specify common technologies, systems, and processes critical to both the Navy's future LCS and the Coast Guard's Deepwater National Security Cutter, Offshore Patrol Cutter, and patrol boat developments.[2]

The linkage, institutionalized with regular meetings and information exchanges at all levels in each PEO's staff, ensures that each service will derive mutual benefits through a cooperative organizational, business, and technical approach in areas of common interest. This linkage does not suggest a duplication of effort; rather, it reflects the wisdom of close cooperation and, where appropriate, collaboration to achieve common benefits as each acquisition program matures.

This Coast Guard-Navy linkage is reflected in the work of Deepwater's C4ISR Integrated Product Team (IPT). The Navy's Space and Naval Warfare Systems Command (SPAWAR) has been a key participant since 1997—recognizing the requirement for Deepwater C4ISR systems to satisfy Navy performance specifications as well as DOD's overarching common standards.

The Office of Naval Research is another important Navy member of Deepwater's partnerships. The Coast Guard's fleet customers—officer and enlisted representatives from operational commands on the "waterfront"—also are engaged to ensure their important perspectives and input are incorporated.

Sea Power 21, announced by Chief of Naval Operations Adm. Vern Clark in 2002, describes how the Navy will organize, integrate its effort, and transform itself to face the 21st century's national-security challenges. The vision's key concepts (Sea Strike, Sea Shield, and Sea Basing) will be enabled by an all-encompassing effort called FORCEnet—the integration of operational commanders, sensors, networks, command and control, platforms, and weapons into a fully netted combat force.[3]

Sea Power 21's reliance on an open-architecture C4ISR system resonates deeply with Deepwater's C4ISR project team. Close Coast Guard-Navy cooperation affords exceptional opportunities for the Coast Guard to leverage its programs with the Navy's ongoing C4ISR developments.

The Integrated Deepwater System's partner in industry is Integrated Coast Guard Systems (ICGS). The Deepwater program has pioneered new approaches to the acquisition process and the concept of government-industry teaming.

Partnering between the Deepwater C4ISR project team and its counterparts at Lockheed Martin, the IDS prime subcontractor to Integrated Coast Guard Systems is yielding important dividends for IDS command-and-control systems—including cutting-edge integrated planning and a performance-based system-of-systems acquisition strategy with a service-wide focus.

On the industry side, Lockheed Martin's Maritime Systems and Sensors division offers decades of experience developing C4ISR systems for the U.S. Navy and other international navies. The synergy of this partnership, reflected in sheer technical knowledge and programmatic advice, is extraordinary.

In December 2002, Lockheed Martin broke ground for a state-of-the-art facility at its Moorestown, N.J., site that will be used to develop, test, and integrate the assets and systems being produced to support the Deepwater program. The $9.4 million facility is located in close proximity to Lockheed Martin's Theater Network Integration Center and Naval Systems Computing Center.

A Year of Progress

Deepwater's C4ISR system marked several important milestones during 2003. The Coast Guard cutter USCGC *Northland*, for example, received the first in a series of enhancements and communication-systems upgrades for 270-foot medium endurance legacy cutters. As the first cutter to receive this upgrade, the *Northland* now boasts improved performance within existing communications systems and has additional access to a variety of intelligence and data sources previously unavailable.

Among its enhanced capabilities, the *Northland* now has access to classified and unclassified data communications through international maritime Satellite B services connectivity to the DOD Secret Internet Protocol Network (SIPRNET). Additional future enhancements include doubling the data bandwidth and improving variable bandwidth efficiency, improvements that will enable cutters to exchange and process information more rapidly.

"Integrated command, control, communications, computers, information, surveillance and reconnaissance systems are the backbone of Deepwater's system-of - systems design," said Gerry Moorman, ICGS president. "This upgrade provides real-time interaction between cutters at sea and shore-based resources, which allows the Coast Guard greater capability to carry out its vital missions."[4]

This upgrade was the direct result of the successful partnership between government and industry, including ICGS, the U.S. Coast Guard Telecommunication Information System Command, the U.S. Navy's Space and Naval Warfare Systems Command, several Lockheed Martin divisions, and the PROSOFT Corporation.

Upgrades to the Coast Guard's inventory of 13 270-foot medium endurance cutters are projected for completion in mid-2004, followed by upgrades to nine 378-foot high

endurance cutters and 14 210-foot medium endurance cutters.

In February 2003, the 110-foot USCGC *Matagorda* became the first of 49 Island-class patrol boats to enter Bollinger Shipyard in Lockport, La., for conversion to a 123-foot vessel with upgraded operational capabilities. She was followed by the USCGC *Metompkin*'s arrival in June, and conversions continued through the summer and autumn as additional 110s arrived.

The *Matagorda*'s improved C4ISR capabilities include commercial satellite communications (International Maritime Satellite for voice and data), an integrated internal communications system with radio-relay capability, an integrated C2 and navigation system providing for display of a common operating picture, integration of radar into the C2 system (the first Coast Guard asset to obtain replacement of the AN/SPS-73), and three multifunction C2 workstations built into the bridge console. A classified local area network with SIPRNET access also was installed.

The *Northland*'s and the *Matagorda*'s upgrades were performed in conjunction with similar Deepwater C4ISR upgrades ashore. The first shore-based communications upgrade under the Integrated Deepwater System program was completed in September 2003 at Communications Area Master Station Atlantic (CAMSLANT).

The upgrade provided for simultaneous SIPRNET and CGDN+ access using TACLANE Type 1 network encryptors, optimized SATCOM bandwidth with web-caching content engines, classified e-mail, and new network management software. This was the first of several Deepwater upgrades planned for the CAMSLANT facility.

The update to the unclassified LAN provides the enterprise connection of the CAMS to the International Maritime Satellite

(INMARSAT) services to allow distribution of the common operating picture. New encryption equipment is included to increase information security. New non-channelized T1 lines connecting the CAMS to the Land Earth Stations (LES) provides additional classified network equipment to connect to the existing SIPRNET and support classified information exchange with cutter assets.

The Communications Area Master Station Pacific (CAMSPAC) facility at Point Reyes, Calif., which supports the Coast Guard's Pacific assets, will receive the same upgrade in February 2004. Such installations form the cornerstone for enabling enhanced operational effectiveness for the Coast Guard's legacy fleet even as new IDS platforms with more capable C4ISR systems are designed for the future.

Tomorrow's Network-Centric System

Today's homeland-security requirements drive an even greater need for expanded connectivity across a broad range of federal, state, and other agencies.

The Deepwater C4ISR architecture will provide a strengthened information backbone for the Coast Guard's many missions, but it also will play a crucial enabling role for attaining higher levels of maritime domain awareness in the future.

The Bush administration's new *U.S. National Strategy for Homeland Security*, approved in July 2002, places a premium on keeping all appropriate agencies, law-enforcement officials, and military units *well informed* regarding vulnerabilities, intelligence, possible threats, and counter-terrorist operations.

The Coast Guard's *Maritime Homeland Security Strategy*, promulgated in December 2002, supports both the administration's new national homeland security strategy as well as the new *National Security Strategy of the United States* (promulgated in September 2002). The Coast Guard's

strategy for maritime homeland security is built on the main pillars of preventing terrorist attacks, reducing U.S. vulnerabilities to attack, and recovering from those attacks that might occur. It seeks to provide needed security improvements while preserving U.S. prosperity by minimizing disruptions or delays to sea-borne commerce and global trade.

Consistent with the new U.S. national security strategy, the Coast Guard's strategy is preemptive in nature. Layered surface and air operations seek to deter, detect, disrupt, or destroy terrorist threats across the maritime domain and to ensure the protection of the maritime infrastructure within U.S. borders. Implementation of this strategy requires the Coast Guard to improve and expand its C4ISR capabilities across all areas of maritime domain operations.

Coast Guard homeland security operations will see the United States reach out to sea many hundreds of miles with a time-proven layered defense critical to maritime domain awareness. Comprehensive understanding of what is happening within the U.S. maritime domain entails precise knowledge of the movement of vessels, cargo, and people. Ideally, potential threats will be identified and neutralized long before they jeopardize the U.S. homeland. Threaded throughout the Coast Guard's strategy is the explicit requirement for robust C4ISR capabilities as the *sine qua non* for success.

Speaking at the International Seapower Symposium in Newport, R.I., in October 2003, Adm. Collins described how the Coast Guard's new strategy recognizes that maritime security in the United States today is a concerted effort that encompasses more than just protecting a nation's national interests against hostile nations. It includes protection against terrorist attacks as well as threats to national sovereignty, natural resources, the environment, and economic prosperity. The collective result of the Coast Guard's maritime security strategy is aimed at reducing maritime security risks.[5]

Adm. Collins maintains that maritime domain awareness is the centerpiece of the Coast Guard's efforts to improve the safety and security of U.S. maritime borders.[6] Maritime domain awareness will be increased through more aggressive and effective means of gathering, using, and sharing information and intelligence—the world of work of Deepwater's C4ISR system (see Table 3).

Table 3. Maritime Domain Awareness

Enabling Maritime Domain Awareness Deepwater's C4ISR System of Systems
• ***Command, Control, and Computers*** Access to strategic, operational, and tactical information and plans. Common operational picture between shore commands, cutters, and aircraft Mobile and shore assets linkage to enable logistics support Training and support costs reduced.
• ***Communication*** Broad spectrum, reliable, and integrated to ensure interoperability. Automation to reduce operational workload and maintenance.
• ***Intelligence*** Integration of intelligence data into common operating picture. Rapid secure dissemination of intelligence products to operating forces. Connectivity to federal, state, and local agencies. Fusion and correlation of multi-intelligence information.
• ***Surveillance and Reconnaissance*** Data from multiple sources and sensors fused into common picture. Improved surveillance, detection, classification, and identification performance.

Deepwater's entire C4ISR system is now planned for development in four incremental stages over the first 10 years of the IDS 20-year program. New systems will be incorporated in new-construction assets approximately every four years and be backfitted to older platforms. This approach will provide one C4ISR design for multiple assets—assuring both interoperability as well as commonality across the fleet.

Deepwater's C4ISR system will be a *critical enabler* for maritime domain awareness in many important ways—its provision for the rapid, secure, and networked dissemination of data and information will allow Coast Guard operational commanders to make more informed decisions and, should the need arise, to employ all of the forces at their disposal in the most productive manner possible to target actual threats.

In the view of Rear Adm. Stillman, Deepwater's C4ISR system will lead to a true network-centric Coast Guard so essential for the effective accomplishment of its many missions.

"Unlike today's platform-centric Coast Guard," Stillman explains, "Deepwater's fully interoperable C4ISR system will provide the means to communicate information and data quickly and securely between all Coast Guard units and other agencies."

"This transformation will see Coast Guard air and surface platforms serving as nodes for shared information and operational knowledge with command centers ashore—a potent force multiplier that will enable units to conduct their missions as a connected, distributed force," Stillman said.[7]

CONCLUSION

The U.S. Coast Guard stands at a unique point in its 213-year history. It is confronting a growing array of mission demands and maritime-security threats with a well-reasoned, comprehensive, and flexible plan to modernize and recapitalize its aging fleet.

The Integrated Deepwater System is key to the Coast Guard's transformation for the 21st century as its platforms and systems evolve to become a distributed, netted force.

Deepwater's C4ISR system will serve an important enabling role in this transformation—leading the way to change today's platform-centric Coast Guard into a network-centric force fully prepared for the challenges of tomorrow: Semper Paratus!

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